

Claims

What is claimed is:

5 1. A medical device comprising a balloon, the balloon formed from a block copolymer thermoplastic elastomer polymer, the polymer being characterized by a flexural modulus of about 150,000 psi or less and a Shore D hardness of at least 60, the balloon having a single wall thickness of less than 0.001 inches and a wall strength in excess of 15,000 psi.

10 2. A medical device as in claim 1 wherein the wall strength of the balloon is in excess of 20,000 psi.

3. A medical device as in claim 1 wherein the polymer is further
15 characterized by an ultimate elongation of about 300% or higher.

4. A medical device as in claim 1 wherein the balloon has a nominal diameter of 1.5-10 mm.

20 5. A medical device as in claim 1 further comprising a catheter having a distal end, said balloon being mounted on the catheter near said distal end.

6. A medical device as in claim 1 wherein the block copolymer has a Shore D hardness in the range of 65-75 and a flexural modulus in the range of 50,000-120,000
25 psi.

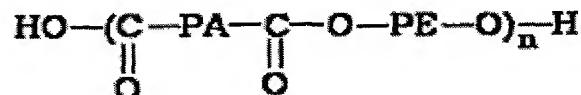
7. A medical device as in claim 1 wherein the polymer is a polyether-block-amide copolymer comprising at least two polyamide hard segments and at least two polyether soft segments.

30 8. A medical device as in claim 7 wherein the polyamide hard segments are polyamides of C₆ or higher carboxylic acids and C₆ or higher organic diamines or of C₆

or higher aliphatic ω -amino- α -acids, and the polyether soft segments are polyethers of C₂-C₁₀ diols.

9. A medical device as in claim 8 wherein the percentage by weight of the
5 block copolymer attributable to the hard segments is between about 50% and about
95%.

10. A medical device as in claim 6 wherein the block copolymer is
10 represented by the formula:



in which PA is a polyamide segment of molecular weight in the range of 500-8,000; PE is a polyether segment of molecular weight in the range of 500-2,500 and the repeating number n is between 5 and 10.

15 11. A medical device as in claim 10 wherein the block copolymer segment, PA, is an aliphatic polyamide of one or more C₁₀ - C₁₂ aliphatic acids and one or more C₁₀ - C₁₂ aliphatic diamines or of a C₁₀ - C₁₂ aliphatic ω -amino- α -acid.

20 12. A medical device as in claim 10 wherein the polyamide segment, PA, is selected from the group consisting of nylon 12, nylon 11, nylon 9, nylon 6, nylon 6/12, nylon 6/11, nylon 6/9 and nylon 6/6.

13. A medical device as in claim 10 wherein the polyamide segment, PA, is
25 nylon 12 of a molecular weight of 3,000-5,000, and the polyether segment, PE, is poly(tetramethylene ether) of molecular weight between 500 and 1250.

14. A medical device as in claim 10 wherein the polyamide segments, PA,
comprise between 80 and 90% by weight of the polyamide/polyether polyester.

15. A medical device as in claim 10 wherein said polyether segment, is selected from the group consisting of poly(tetramethylene ether), poly(pentamethylene ether) and poly(hexamethylene ether).

5 16. A medical device as in claim 1 wherein the polymer is a polyester-block-ether copolymer comprising at least two polyester hard segments and at least two polyether soft segments.

10 17. A medical device as in claim 16 wherein the polyester hard segments are polyesters of an aromatic dicarboxylic acid and a C₂-C₄ diol and the polyether soft segments are polyethers of C₂-C₁₀ diols.

15 18. A medical device as in claim 17 wherein the percentage by weight of the block copolymer attributable to the hard segments is between about 50% and about 95%.

20 19. A medical device as in claim 16 wherein said polyester segments are polyesters of an acid selected from the group consisting of ortho-, meta- or para-phthalic acid, naphthalenedicarboxylic acid and meta-terphenyl-4,4'-dicarboxylic acids and a diol selected from the group consisting of ethylene glycol, 1,3-propane diol and 1,4-butane diol.

25 20. A medical device as in claim 16 wherein the block copolymer is poly(butylene terephthalate-*block*-poly(tetramethylene oxide)).

21. A medical device as in claim 1 wherein the block copolymer is further characterized by a ultimate tensile strength of at least 6,000 psi.

30 22. A medical device as in claim 1 wherein the polymer has a Shore D hardness of at least 63.

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